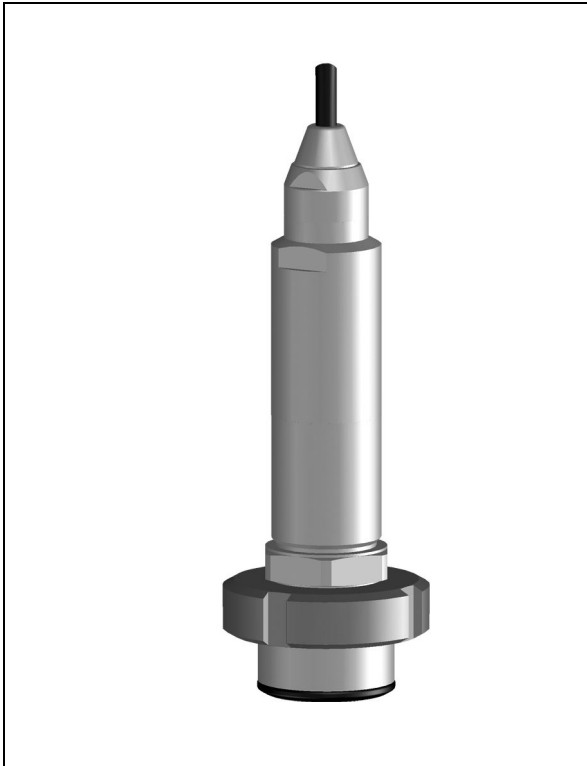


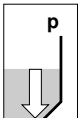
Operating Instructions

VEGABAR 74

4 ... 20 mA/HART



Process pressure/
Hydrostatic



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Supplementary documentation



Information:

Depending on the ordered version, supplementary documentation belongs to the scope of delivery. You find this documentation in chapter "*Product description*".

Instructions manuals for accessories and replacement parts



Tip:

To ensure reliable setup and operation of your VEGABAR 74, we offer accessories and replacement parts. The associated documents are:

- Supplementary instructions manual 32036 "*Welded socket and seals*"
- Operating instructions manual 32798 "*Breather housing VEGABOX 02*"
- Operating instructions manual 20591 "*External indicating and adjustment unit VEGADIS 12*"

1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance and fault rectification. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

1.2 Target group

This operating instructions manual is directed to trained personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbolism used



Information, tip, note

This symbol indicates helpful additional information.



Caution: If this warning is ignored, faults or malfunctions can result.

Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.



Ex applications

This symbol indicates special instructions for Ex applications.



List

The dot set in front indicates a list with no implied sequence.



Action

This arrow indicates a single action.



Sequence

Numbers set in front indicate successive steps in a procedure.

2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the operator.

During work on and with the device the required personal protection equipment must always be worn.

2.2 Appropriate use

VEGABAR 74 is a pressure transmitter for measurement of gauge pressure, absolute pressure and vacuum.

You can find detailed information on the application range in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

Due to safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

2.3 Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

This is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards as well as all prevailing safety regulations and accident prevention rules.

The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for trouble-free operation of the instrument.

During the entire duration of use, the user is obliged to determine the compliance of the required occupational safety measures with the current valid rules and regulations and also take note of new regulations.

2.5 Safety approval markings and safety tips

The safety approval markings and safety tips on the device must be observed.

2.6 CE conformity

VEGABAR 74 is in CE conformity with EMC (89/336/EWG), fulfils NAMUR recommendation NE 21 and is in CE conformity with LVD (73/23/EWG).

Conformity has been judged according to the following standards:

- EMC:
 - Emission EN 61326: 2004 (class B)
 - Susceptibility EN 61326: 2004 including supplement A
- LVD: EN 61010-1: 2001

VEGABAR 74 is not subject to the pressure device guideline.¹⁾

2.7 Fulfilling NAMUR recommendations

VEGABAR 74 fulfills the following NAMUR recommendations:

- NE 21 (interference resistance and emitted interference)
- NE 43 (signal level for failure information)
- NE 53 (compatibility sensor and indicating/adjustment components)

VEGA instruments are generally upward and downward compatible:

- Sensor software to DTM VEGABAR 74 HART
- DTM VEGABAR 74 for adjustment software PACTware™

The parameter adjustment of the basic sensor functions is independent of the software version. The range of available functions depends on the respective software version of the individual components.

The software version of VEGABAR 74 HART can be read out via PACTware™.

¹⁾ Due to the flush diaphragm, no own pressure compartment is formed.

You can view all software histories on our website www.vega.com. Make use of this advantage and get registered for update information via e-mail.

2.8 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

2.9 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGABAR 74 pressure transmitter
- Documentation
 - this operating instructions manual
 - Test certificate for pressure transmitters
 - Ex-specific "*Safety instructions*" (with Ex-versions)
 - if necessary, further certificates

Components

VEGABAR 74 consists of the following components:

- Process fitting with measuring cell
- Housing with electronics
- Connection cable (direct cable outlet)

The components are available in different versions.

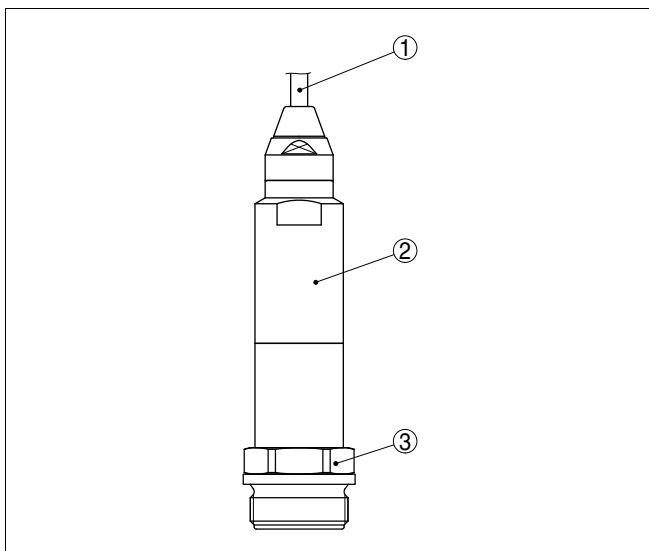


Fig. 1: Example of a VEGABAR 74 with process fitting G1½ A

- 1 Connection cable
- 2 Housing with electronics
- 3 Process fitting with measuring cell

3.2 Principle of operation

Area of application

VEGABAR 74 is a pressure transmitter for use in the paper, food processing and pharmaceutical industry. Thanks to the high protection class IP 68/IP 69K it is particularly suitable for use in humid environment. Depending on the version, it is used for level, gauge pressure, absolute pressure or vacuum measurements. Measured products are gases, vapours and liquids, also with abrasive contents.

Functional principle

The sensor element is the CERTEC® measuring cell with flush, abrasion resistant ceramic diaphragm. The hydrostatic pressure of the medium or the process pressure causes a capacitance change in the measuring cell via the diaphragm. This change is converted into an appropriate output signal and outputted as measured value.

The CERTEC® measuring cell is also equipped with a temperature sensor. The temperature value can be processed via the signal output.

Supply

Two-wire electronics 4 ... 20 mA/HART for power supply and measured value transmission over the same cable.

The supply voltage range can differ depending on the instrument version.

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

3.3 Operation

VEGABAR 74 4 ... 20 mA/HART can be adjusted with different adjustment media:

- with external adjustment/indication VEGADIS 12
- an adjustment software according to FDT/DTM standard, e.g. PACTware™ and PC
- with a HART handheld

The kind of adjustment and the adjustment options depend on the selected adjustment component. The entered parameters are generally saved in the respective sensor, when adjusting with PACTware™ and PC optionally also in the PC.

3.4 Packaging, transport and storage

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test according to DIN EN 24180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Transport

Transport must be carried out under consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

Transport inspection

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

Storage

Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

Storage and transport temperature

- Storage and transport temperature see "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 ... 85 %

4 Mounting

4.1 General instructions

Materials, wetted parts

Make sure that the wetted parts of VEGABAR 74, especially the seal and process fitting, are suitable for the existing process conditions such as pressure, temperature etc. as well as the chemical properties of the medium.

You can find the specifications in chapter "*Technical data*" in the "*Supplement*".

Temperature limits

Higher process temperatures often mean also higher ambient temperatures. Make sure that the upper temperature limits stated in chapter "*Technical data*" for the environment of the electronics housing and connection cable are not exceeded.

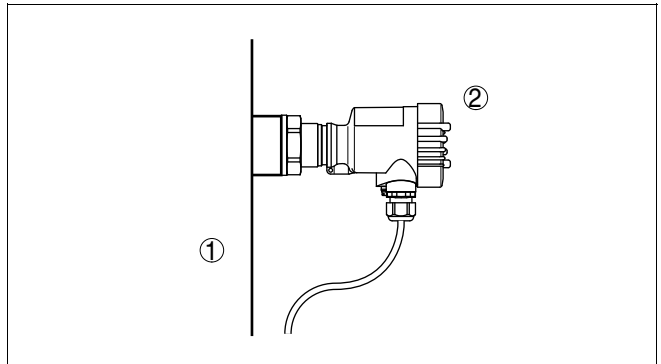


Fig. 2: Temperature ranges

- 1 Process temperature
- 2 Ambient temperature

Connection

- The connection cable has a capillary for atmospheric pressure compensation
- Lead the cable end into a dry space or into a suitable terminal housing.



Information:

VEGA recommends the breather housing VEGABOX 02 or the indication/adjustment VEGADIS 12. Both contain terminals and a ventilation filter for pressure compensation. For mounting outdoors, a suitable protective cover is available.

4.2 Mounting steps

Sealing/Screwing in threaded versions

Seal the thread with teflon, hemp or a similar resistant seal material on the process fitting thread 1½ NPT.

→ Screw VEGABAR 74 into the welded socket. Tighten the hexagon on the process fitting with a suitable wrench. Wrench size, see chapter "*Dimensions*".

Sealing/Screwing in flange versions

Seal the flange connections according to DIN/ANSI with a suitable, resistant seal and mount VEGABAR 74 with suitable screws.

Sealing/Screwing in hygienic fittings

Use the seal suitable for the respective process fitting. You can find the components in the line of VEGA accessories in the supplementary instructions manual "*Welded socket and seals*".

5 Connecting to power supply

5.1 Preparing the connection

Note safety instructions

Always keep in mind the following safety instructions:

- Connect only in the complete absence of line voltage
- If overvoltage surges are expected, versions with integrated overvoltage arresters should be used or external overvoltage arresters should be installed



Tip:

We recommend the version of VEGABAR 74 with integrated overvoltage arrester or VEGA type ÜSB62-36G.X as external overvoltage arrester.

Take note of safety instructions for Ex applications



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

Select power supply

Power supply and current signal are carried on the same two-wire cable. The voltage supply range can differ depending on the instrument version.

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

Provide a reliable separation of the supply circuit from the mains circuits according to DIN VDE 0106 part 101.

VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as all VEGAMETs meet this requirement. When using one of these instruments, protection class III is ensured for VEGABAR 74.

Bear in mind the following factors regarding supply voltage:

- Output voltage of the power supply unit can be lower under nominal load (with a sensor current of 20.5 mA or 22 mA in case of fault message)
- Influence of additional instruments in the circuit (see load values in chapter "*Technical data*")

Selecting connection cable

VEGABAR 74 is connected with standard two-wire cable without screen. An outer cable diameter of 5 ... 9 mm ensures the seal effect of the cable gland when connecting via VEGABOX 02 or VEGADIS 12. If electromagnetic interference is expected which is above the test values of EN 61326 for

industrial areas, screened cable should be used. For HART multidrop operation we recommend as standard practice the use of screened cable.

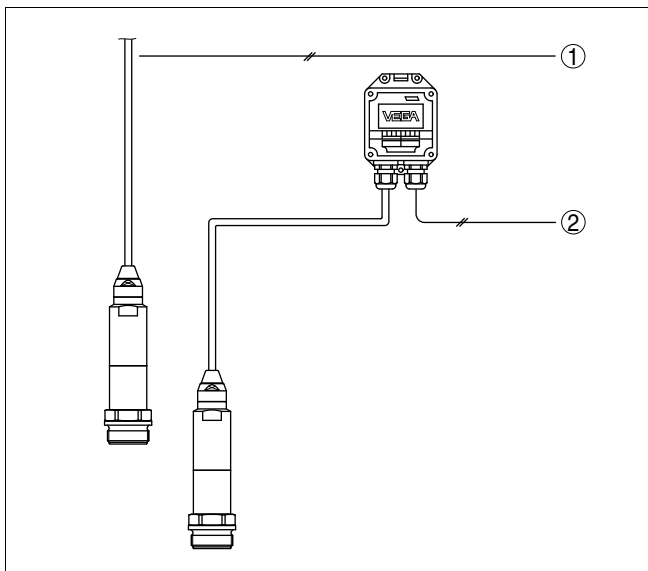


Fig. 3: Connection of VEGABAR 74

1 Direct connection

2 Connection via VEGABOX 02 or VEGADIS 12

Cable screening and grounding

If screened cable is necessary, connect the cable screen on both ends to ground potential. In the VEGABOX 02 or VEGADIS 12, the screen must be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the potential equalisation (low impedance).

If potential equalisation currents are expected, the connection on the processing side must be made via a ceramic capacitor (e.g. 1 nF, 1500 V). The low frequency potential equalisation currents are thus suppressed, but the protective effect against high frequency interference signals remains.

Select connection cable for Ex applications



Take note of the corresponding installation regulations for Ex applications. In particular, make sure that no potential equalisation currents flow over the cable screen. In case of grounding on both sides this can be achieved by the use of a capacitor or a separate potential equalisation.

5.2 Connection procedure

Direct connection

Proceed as follows:

- 1 Wire the connection cable up to the connection compartment. The bending radius must be at least 25 mm.²⁾
- 2 Connect the wire ends to the screw terminals according to the wiring plan

Via VEGABOX 01 or VEGADIS 12

Proceed as follows:

- 1 Snap connection housing onto the carrier rail or screw it to the mounting plate
 - 2 Loosen the cover screws and remove the cover
 - 3 Insert the cable through the cable entry into the connection housing housing
 - 4 Loosen the screws with a screwdriver
 - 5 Insert the wire ends into the open terminals according to the wiring plan
 - 6 Tighten the screws with a screwdriver
 - 7 Check the hold of the wires in the terminals by lightly pulling on them
 - 8 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable
 - 9 Connect the supply cable according to steps 3 to 8
 - 10 Screw the housing cover back on
- The electrical connection is finished.

²⁾ The connection cable is already preconfecteded. After shortening the cable, fasten the type plate with support again to the cable.

5.3 Wiring plan

Direct connection

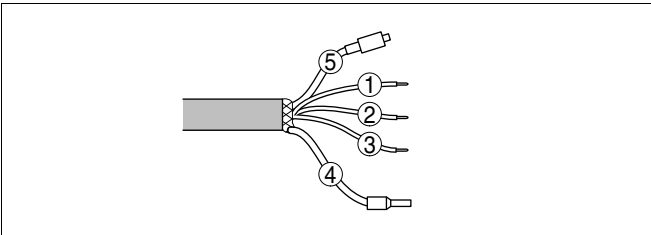


Fig. 4: Wire assignment, connection cable
1 brown (+): to power supply or to the processing system
2 blue (-): to power supply or to the processing system
3 yellow: is only required with VEGADIS 12, otherwise connect to minus or with VEGABOX 01 to terminal 3³⁾
4 Screen
5 Breather capillaries with filter element

Connection via VEGABOX 02

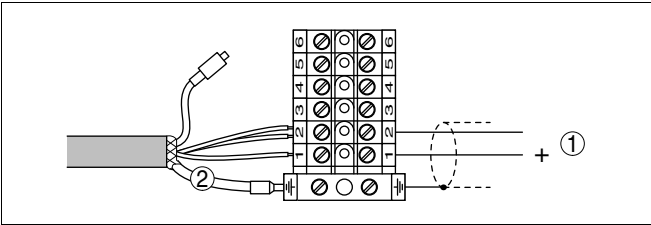


Fig. 5: Terminal assignment VEGABAR 74
1 To power supply or the processing system
2 Screen⁴⁾

Wire number	Wire colour/Polarity	VEGABAR 74 terminal
1	brown (+)	1
2	blue (-)	2
3	Yellow	2
	Screen	Ground

³⁾ For customer-specific versions already connected with blue (-) when being shipped.
⁴⁾ Connect screen to ground terminal. Connect ground terminal on the outside of the housing as prescribed. The two terminals are galvanically connected.

Connection via VEGADIS 12

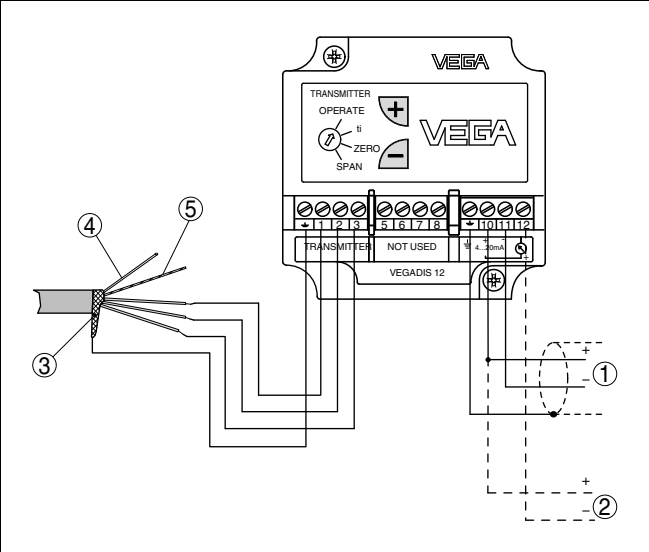


Fig. 6: Terminal assignment, VEGADIS 12

- 1 To power supply or the processing system
- 2 Control instrument (4 ... 20 mA measurement)
- 3 Screen⁵⁾
- 4 Breather capillaries
- 5 Suspension cable

Wire number	Wire colour/Polarity	Terminal VEGADIS 12
1	brown (+)	1
2	blue (-)	2
3	Yellow	3

⁵⁾ Connect screen to ground terminal. Connect ground terminal on the outside of the housing as prescribed. The two terminals are galvanically connected.

6 Set up

6.1 Setup steps without VEGADIS 12

After mounting and electrical connection, VEGABAR 74 is ready for operation.

→ Switch on voltage

The electronics now carries out a self-check for approx. 2 seconds. Then VEGABAR 74 delivers a current of 4 ... 20 mA according to the actual level.

6.2 Setup steps with VEGADIS 12

Adjustment volume

- zero - measuring range begin
- span - measuring range end
- ti - Integration time

Adjustment system

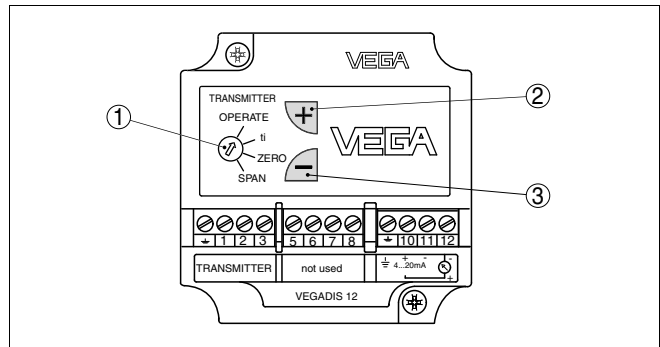


Fig. 7: Adjustment elements of VEGADIS 12

- 1 Rotary switch: choose the requested function
- 2 **[+]** key, change value (rising)
- 3 **[-]** key, change value (falling)

- With the rotary switch the requested function is selected
- With the **[+]** and **[-]** keys, the signal current or the integration time are adjusted
- Finally the rotary switch is set to position "OPERATE"

The set values are transmitted to the EEPROM memory and remain there even in case of voltage loss.

Adjustment steps, adjustment

Proceed as follows for adjustment with VEGADIS 12:

- 1 Open housing cover
- 2 Connect hand multimeter to terminals 10 and 12
- 3 Meas. range begin: Set rotary switch to "zero"

- 4 Empty the vessel or reduce process pressure
- 5 Set a current of 4 mA with the **[+]** and **[-]** keys
- 6 Meas. range end: Set rotary switch to "*span*"
- 7 Fill the vessel or increase process pressure
- 8 Set a current of 20 mA with the **[+]** and **[-]** keys
- 9 Operation: Set rotary switch to "*OPERATE*"
- 10 Close housing cover

The adjustment data are effective, the output current 4 ... 20 mA corresponds to the actual level.

Adjustment steps, integration time

Proceed as follows for the adjustment of the integration time with VEGADIS 12:

- 1 Open housing cover
- 2 Set rotary switch to "*t*"
- 3 By pushing the **[-]** key 10-times, make sure that the integration time is set to 0 sec.
- 4 For every 1 sec. requested integration time, push the **[+]** key once.
- 5 The integration time is the time required by the output current signal to reach 90 % of the actual height after a sudden level change.
- 6 Set rotary switch to "*OPERATE*"
- 7 Close housing cover

Adjustment steps, scaling

The display outputs the current 4 ... 20 mA as bar graph and digital value.

With 4 mA no segment of the bar graph appears, with 20 mA all segments appear. This assignment is fix.

You can scale the digital value to any value between -9999 ... +9999 via the adjustment module.

Proceed as follows for scaling the indication of VEGADIS 12:

- 1 Open housing cover
- 2 Initial value: Set rotary switch to "*zero*"
- 3 Set the requested value, e.g. 0 with the **[+]** and **[-]** keys
- 4 Final value: Set the rotary switch to "*span*"
- 5 Set the requested value, e.g. 1000 with the **[+]** and **[-]** keys
- 6 Decimal point: Set the rotary switch to "*point*"
- 7 With the **[+]** and **[-]** keys you can adjust the requested value, e.g. 8888 (no decimal point)

8 Set rotary switch to "*OPERATE*"

9 Close housing cover

The adjustment data are effective, the output current 4 ... 20 mA corresponds to the actual level.

7 Setup with PACTware™

7.1 Connect the PC with VEGACONNECT 3

Connecting the PC to the signal cable

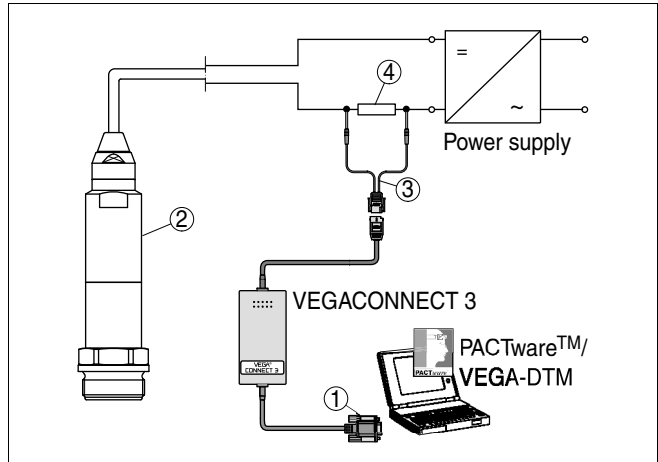


Fig. 8: Connecting the PC to the signal cable

- 1 RS232 connection (with VEGACONNECT 3) or USB connection (with VEGACONNECT 4)
- 2 VEGABAR 74
- 3 HART adapter cable
- 4 HART resistance 250 Ohm (optional depending on the processing)

Necessary components:

- VEGABAR 74
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 or 4 with HART adapter cable (art. no. 2.25397)
- HART resistance approx. 250 Ohm
- Power supply unit



Note:

With power supply units with integrated HART resistance (internal resistance approx. 250 Ohm), an additional external resistance is not necessary (e.g. VEGATRENN 149A, VEGADIS 371, VEGAMET 381/624/625, VEGASCAN 693). In such cases, VEGACONNECT 3 can be connected parallel to the 4 ... 20 mA cable.

7.2 Connect the PC with VEGACONNECT 4

Connection via HART

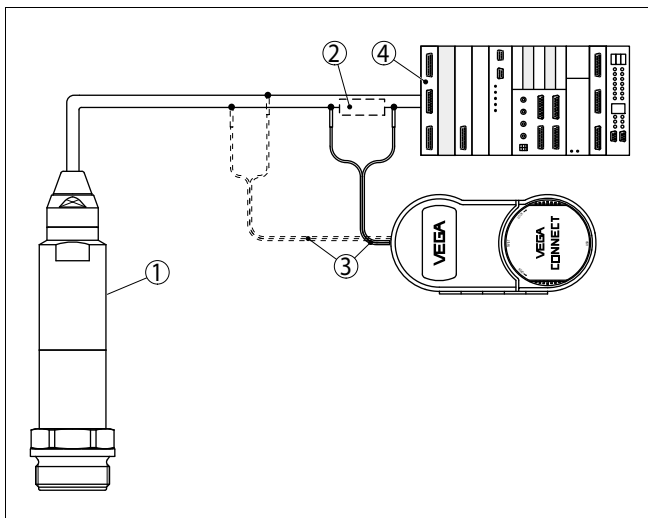


Fig. 9: Connecting the PC via HART to the signal cable

- 1 VEGABAR 74
- 2 HART resistance 250 Ohm (optional depending on the processing)
- 3 Connection cable with 2 mm pins and terminals
- 4 Processing system/PLC/Voltage supply

Necessary components:

- VEGABAR 74
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 4
- HART resistance 250 Ohm (optional depending on the processing)
- Power supply unit or processing system



Note:

With power supply units with integrated HART resistance (internal resistance approx. 250 Ohm), an additional external resistance is not necessary. This applies, e.g. to the VEGA instruments VEGATRENN 149A, VEGADIS 371, VEGAMET 381). Also usual Ex separators are most of the time equipped with a sufficient current limitation resistor. In such cases, VEGACONNECT 4 can be connected parallel to the 4 ... 20 mA cable.

7.3 Parameter adjustment with PACTware™

Further setup steps are described in the operating instructions manual "*DTM Collection/PACTware™*" attached to each CD and which can also be downloaded from our homepage. A detailed description is available in the online help of PACTware™ and the VEGA DTMs.

**Note:**

Keep in mind that for setup of VEGABAR 74, DTM-Collection in the actual version must be used.

All currently available VEGA DTMs are provided in the DTM Collection on CD and can be obtained from the responsible VEGA agency for a token fee. This CD includes also the up-to-date PACTware™ version. The basic version of this DTM Collection incl. PACTware™ is also available as a free-of-charge download from the Internet.

Go via www.vega.com and "*Downloads*" to the item "*Software*".

7.4 Parameter adjustment with AMS™ and PDM

For VEGA sensors, instrument descriptions for the adjustment programs AMS™ and PDM are available as DD or EDD. The instrument descriptions are already implemented in the current versions of AMS™ and PDM. For older versions of AMS™ and PDM, a free-of-charge download is available via Internet.

Go via www.vega.com and "*Downloads*" to the item "*Software*".

7.5 Saving the parameter adjustment data

It is recommended to document or save the parameter adjustment data. They are hence available for multiple use or service purposes.

The VEGA DTM Collection and PACTware™ in the licensed, professional version provide suitable tools for systematic project documentation and storage.

8 Maintenance and fault rectification

8.1 Maintenance

When used as directed in normal operation, VEGABAR 74 is completely maintenance free.

8.2 Fault clearance

Reaction in case of failures	The operator of the system is responsible for taken suitable measures to remove interferences.
Causes of malfunction	VEGABAR 74 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.: ● Sensor ● Process ● Supply ● Signal processing
Fault rectification	The first measures to be taken are to check the output signals as well as to evaluate the error messages via the indicating and adjustment module. The procedure is described below. Further comprehensive diagnostics can be carried out on a PC with the software PACTware™ and the suitable DTM. In many cases, the causes can be determined in this way and faults can be rectified.
24 hour service hotline	However, if these measures are not successful, call the VEGA service hotline in urgent cases under the phone no. +49 1805 858550. The hotline is available to you 7 days a week round-the-clock. Since we offer this service world-wide, the support is only available in the English language. The service is free of charge, only the standard telephone costs will be charged.
Checking the 4 ... 20 mA signal	Connect a handheld multimeter in the suitable measuring range according to the wiring plan. ? 4 ... 20 mA signal not stable ● Level fluctuations → Adjust integration time via PACTware™ ● no atmospheric pressure compensation → Check the capillaries and cut them clean

- Check the pressure compensation in the housing and clean the filter element, if necessary
- ? 4 ... 20 mA signal missing
 - Wrong connection to power supply
 - Check connection according to chapter "*Connection steps*" and if necessary, correct according to chapter "*Wiring plan*"
 - No voltage supply
 - Check cables for breaks; repair if necessary
 - supply voltage too low or load resistance too high
 - Check, adapt if necessary
- ? Current signal 3.6 mA; 22 mA
 - electronics module or measuring cell defective
 - Exchange instrument or return instrument for repair



In Ex applications, the regulations for the wiring of intrinsically safe circuits must be observed.

Reaction after fault rectification

Depending on the failure reason and measures taken, the steps described in chapter "*Set up*" must be carried out again, if necessary.

8.3 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) from the Internet on our homepage www.vega.com under: "*Downloads - Forms and certificates - Repair form*".

By doing this you help us carry out the repair quickly and without having to call back for needed information.

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging
- Please ask the agency serving you for the address of your return shipment. You can find the respective agency on our website www.vega.com under: "*Company - VEGA world-wide*"

9 Dismounting

9.1 Dismounting steps

**Warning:**

Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel, high temperatures, corrosive or toxic products etc.

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

9.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the electronics to be easily separable.

WEEE directive 2002/96/EG

This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws (in Germany, e.g. ElektroG). Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects to persons and environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

10 Supplement

10.1 Technical data

General data

Manufacturer	VEGA Grieshaber KG, D-77761 Schiltach
Type name	VEGABAR 74
Parameter, pressure	Gauge pressure, absolute pressure, vacuum
Measuring principle	Ceramic-capacitive, dry measuring cell
Communication interface	None

Materials and weights

Material 316L corresponds to 1.4404 or 1.4435

Materials, wetted parts

- Process fitting 316L
- Diaphragm sapphire ceramic® (99.9 % oxide ceramic)
- Seal FKM (e.g. Viton), Kalrez 6375, EPDM, Chemraz 535
- Seal process fitting thread G½ A, G1½ A Klingersil C-4400

Materials, non-wetted parts

- Housing 316L
- Ground terminal 316Ti/316L
- Connection cable PUR, FEP, PE
- type label support on cable PE-HART

Weight 0.8 ... 8 kg (1.8 ... 17.6 lbs), depending on process fitting

Output variable

Output signal	4 ... 20 mA/HART
Failure signal	22 mA (3.6 mA), adjustable
Max. output current	22.5 mA
Damping (63 % of the input variable)	0 ... 10 s, adjustable
Step response or adjustment time	70 ms (ti: 0 s, 0 ... 63 %)
Fulfilled NAMUR recommendations	NE 43

Additional output parameter - temperature

Processing is made via HART-Multidrop

Range	-50 ... +150 °C (-58 ... +302 °F)
Resolution	1 °C (1.8 °F)
Accuracy	
– in the range of 0 ... +100°C (+32 ... +212 °F)	±3 K
– in the range of -50 ... 0 °C (-58 ... +32 °F) and +100 ... +150 °C (+212 ... +302 °F)	typ. ±4 K

Input variable

Adjustment

Zero adjustable	-20 ... +95 % of the nominal measuring range
Span adjustable	3.3 ... +120 % of the nominal measuring range
Recommended max. turn down	10:1

Nominal measuring ranges and overload resistance

Nominal range	Overload, max. pressure ⁶⁾	Overload, min. pressure
Gauge pressure		
0 ... 0.1 bar/0 ... 10 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
0 ... 0.2 bar/0 ... 20 kPa	20 bar/2000 kPa	-0.4 bar/-40 kPa
0 ... 0.4 bar/0 ... 40 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 ... 5 bar/0 ... 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
0 ... 10 bar/0 ... 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
0 ... 25 bar/0 ... 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
0 ... 60 bar/0 ... 6000 kPa	200 bar/20000 kPa	-1 bar/-100 kPa
-1 ... 0 bar/-100 ... 0 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
-1 ... 1.5 bar/-100 ... 150 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
-1 ... 5 bar/-100 ... 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
-1 ... 10 bar/-100 ... 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
-1 ... 25 bar/-100 ... 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
-1 ... 60 bar/-100 ... 6000 kPa	300 bar/30000 kPa	-1 bar/-100 kPa
-0.05 ... 0.05 bar/-5 ... 5 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
-0.1 ... 0.1 bar/-10 ... 10 kPa	20 bar/2000 kPa	-0.4 bar/-40 kPa

⁶⁾ Limited to 200 bar according to the pressure device directive.

Nominal range	Overload, max. pressure ⁶⁾	Overload, min. pressure
-0.2 ... 0.2 bar/-20 ... 20 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
-0.5 ... 0.5 bar/-50 ... 50 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
Absolute pressure		
0 ... 0.1 bar/0 ... 10 kPa	15 bar/1500 kPa	
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	
0 ... 5 bar/0 ... 500 kPa	65 bar/6500 kPa	
0 ... 10 bar/0 ... 1000 kPa	90 bar/9000 kPa	
0 ... 25 bar/0 ... 2500 kPa	130 bar/13000 kPa	
0 ... 60 bar/0 ... 6000 kPa	200 bar/20000 kPa	

Reference conditions and influencing variables (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1

- Temperature +15 ... +25 °C (+59 ... +77 °F)
- Relative humidity 45 ... 75 %
- Air pressure 860 ... 1060 mbar/86 ... 106 kPa (12.5 ... 15.4 psi)

Determination of characteristics Limit point adjustment according to IEC 61298-2

Characteristics linear

Reference installation position upright, diaphragm points downward

Influence of the installation position <0.2 mbar/20 Pa (0.003 psi)

Deviation determined according to the limit point method according to IEC 60770⁷⁾

Applies to **digital** HART interface as well as to **analogue** current output 4 ... 20 mA.
Specifications refer to the set span. Turn down (TD) = nominal measuring range/set span.

Deviation

- Turn down 1:1 up to 5:1 <0.075 %
- Turn down up to 10:1 <0.015 % x TD

Deviation with absolutely flush process fittings EV, FT

- Turn down 1:1 up to 5:1 <0.05 %
- Turn down up to 10:1 <0.01 % x TD

⁷⁾ Incl. non-linearity, hysteresis and non-repeatability.

Deviation with absolute pressure measuring range 0.1 bar

- Turn down 1:1 up to 5:1 $<0.25 \% \times \text{TD}$
- Turn down up to 10:1 $<0.05 \% \times \text{TD}$

Influence of the product or ambient temperature

Applies to **digital** HART interface as well as to **analogue** current output 4 ... 20 mA. Specifications refer to the set span. Turn down (TD) = nominal measuring range/set span.

Average temperature coefficient of the zero signal

In the compensated temperature range of 0 ... +100 °C (+212 °F), reference temperature 20 °C (68 °F):

Average temperature coefficient of the zero signal

- Turn down 1:1 $<0.05 \% / 10 \text{ K}$
- Turn down 1:1 up to 5:1 $<0.1 \% / 10 \text{ K}$
- Turn down up to 10:1 $<0.15 \% / 10 \text{ K}$

Outside the compensated temperature range:

Average temperature coefficient of the zero signal

- Turn down 1:1 typ. $<0.05 \% / 10 \text{ K}$

Thermal change of the current output

Applies also to the **analogue** 4 ... 20 mA current output and refers to the set span.

Thermal change, current output $<0.15 \% \text{ at } -40 \dots +80 \text{ °C } (-40 \dots +176 \text{ °F})$

Long-term stability (similar to DIN 16086, DINV 19259-1 and IEC 60770-1)

Applies to **digital** HART interface as well as to **analogue** current output 4 ... 20 mA. Specifications refer to the set span. Turn down (TD) = nominal measuring range/set span.

Long-term drift of the zero signal $<(0.1 \% \times \text{TD}) / 1 \text{ year}$

Total deviation (similar to DIN 16086)

The total deviation (max. practical deviation) is the sum of basic accuracy and long-term stability:

$$F_{\text{total}} = F_{\text{perf}} + F_{\text{stab}}$$

$$F_{\text{perf}} = \sqrt{((F_T)^2 + (F_K)^2)}$$

With

- F_{total} : Total deviation
- F_{perf} : Basic accuracy
- F_{stab} : Long-term drift

- F_T : Temperature coefficient (influence of medium or ambient temperature)
- F_{KI} : Deviation

Ambient conditions

Ambient, storage and transport temperature

- Connection cable PE -40 ... +60 °C (-40 ... +140 °F)
- Connection cable PUR, FEP -40 ... +85 °C (-40 ... +185 °F)

Process conditions

The specifications of the pressure stage are used as an overview. The specifications on the type plate are applicable.

Pressure stage, process fitting

- Thread 316L PN 60
- Thread Alu PN 25
- Hygienic fittings 316L PN 10, PN 16, PN 25, PN 40
- Flange 316L, flange with extension 316L PN 40 or 150 lbs, 300 lbs

Product temperature depending on the measuring cell seal

- FKM (e.g. Viton) -20 ... +100 °C (-4 ... +212 °F)
- EPDM -40 ... +100 °C (-40 ... +212 °F), 1 h: 140 °C/284 °F cleaning temperature
- Kalrez 6375 (FFKM) -10 ... +100 °C (+14 ... +212 °F)
- Chemraz 535 -30 ... +100 °C (-22 ... +212 °F)

Vibration resistance mechanical vibrations with 4 g and 5 ... 100 Hz⁸⁾

Shock resistance Acceleration 100 g/6 ms⁹⁾

Electromechanical data

Connection cable

- Configuration four wires, one suspension cable, one breather capillary, screen braiding, metal foil, mantle
- Wire cross-section 0.5 mm² (AWG no. 20)
- wire resistance <0.036 Ohm/m (0.011 Ohm/ft)
- Standard length 6 m (19.685 ft)
- max. length with VEGADIS 12 200 m (656.168 ft)

⁸⁾ Tested according to the regulations of German Lloyd, GL directive 2.

⁹⁾ Tested according to EN 60068-2-27.

– Min. bending radius at 25 °C/77 °F	25 mm (0.985 in)
– Diameter	approx. 8 mm (0.315 in)
– Colour - standard PE	Black
– Colour - standard PUR	Blue
– Colour - Ex-version	Blue

Voltage supply

Supply voltage

– Non-Ex instrument	12 ... 36 V DC
– EEx ia instrument	12 ... 29 V DC

Permissible residual ripple

– <100 Hz	$U_{ss} < 1 \text{ V}$
– 100 Hz ... 10 kHz	$U_{ss} < 10 \text{ mV}$

Load

see diagram

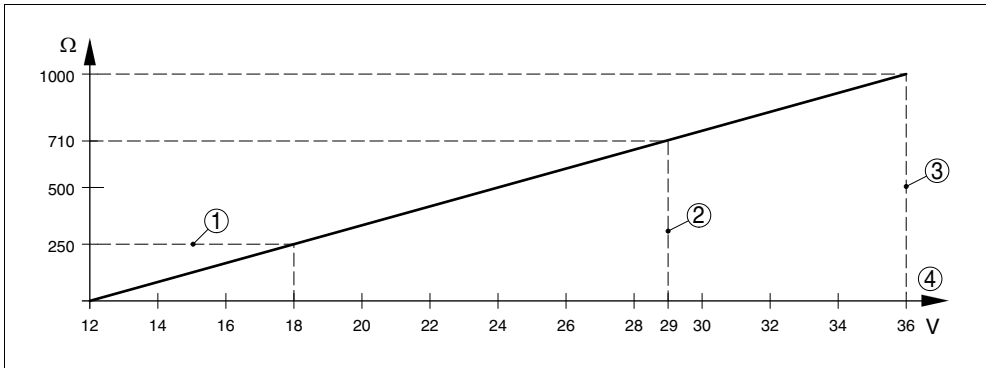


Fig. 10: Voltage diagram VEGABAR 74

- 1 HART load
- 2 Voltage limit Ex instrument
- 3 Voltage limit non-Ex instrument
- 4 Voltage supply

Load in conjunction with VEGADIS 12

see diagram

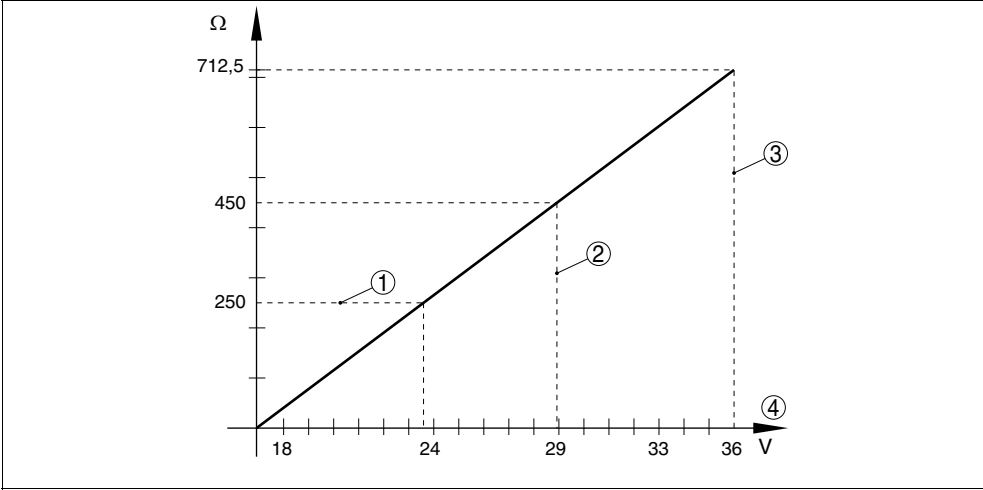


Fig. 11: Voltage diagram VEGABAR 74 with VEGADIS 12

- 1 HART load
- 2 Voltage limit Ex instrument
- 3 Voltage limit non-Ex instrument
- 4 Voltage supply

Integrated overvoltage protection

Nominal leakage current (8/20 μs)	10 kA
Min. response time	<25 ns

Electrical protective measures

Protection	IP 68 (25 bar)/IP 69K
Overvoltage category	III
Protection class	III

Approvals¹⁰⁾

ATEX ia	ATEX II 1G EEx ia IIC T6; ATEX II 2G EEx ia IIC T6
Ship approvals	GL, LRS, ABS, CCS, RINA, DNV
Others	WHG

¹⁰⁾ Deviating data in Ex applications: see separate safety instructions.

10.2 Dimensions

VEGABAR 74 - threaded fitting

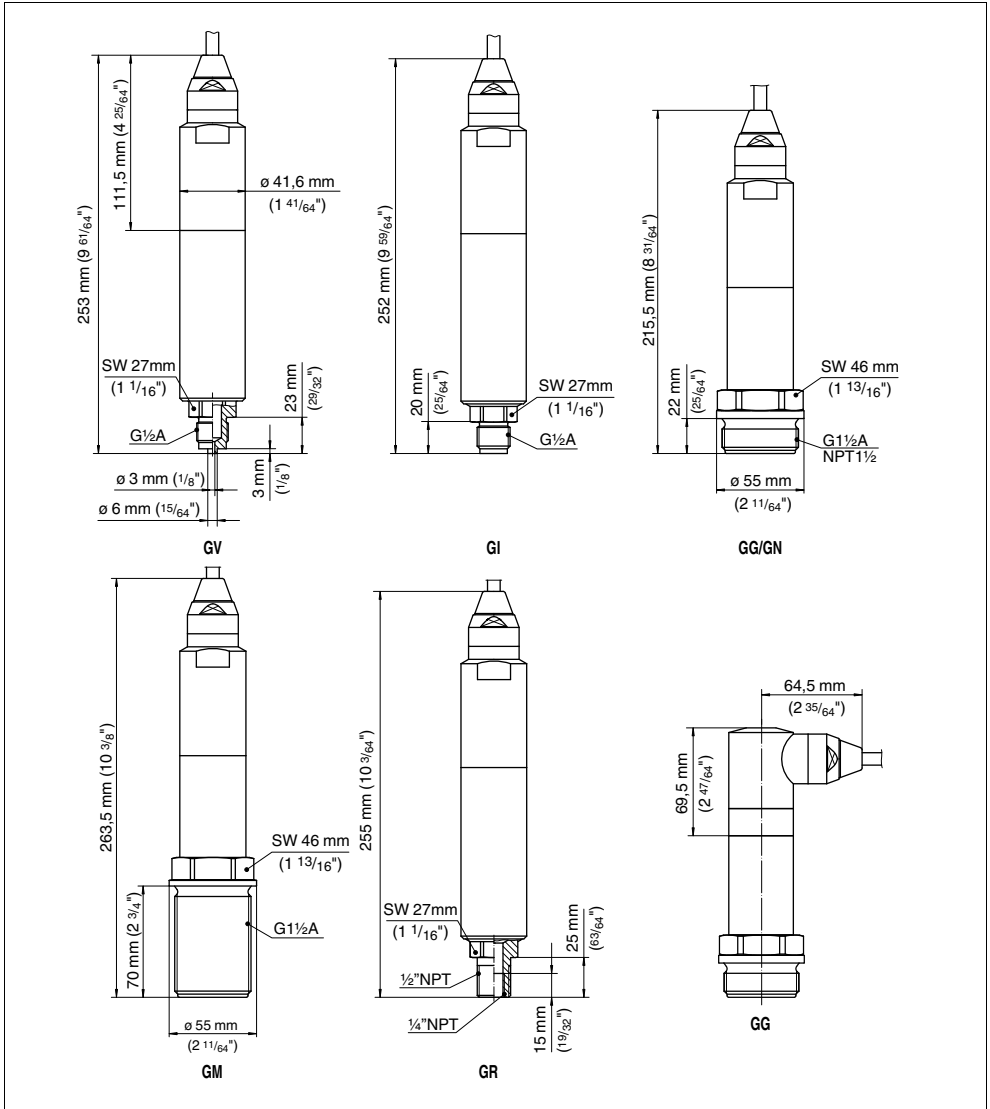


Fig. 12: VEGABAR 74 threaded fitting: GV = $G\frac{1}{2}A$ manometer connection EN 837, GI = $G\frac{1}{2}A$ inner $G\frac{1}{4}A$, GG = $G1\frac{1}{2}A$, GN = $1\frac{1}{2}$ NPT, GM = $G1\frac{1}{2}A$ 70 mm, GR = $\frac{1}{2}$ NPT inner $\frac{1}{4}$ NPT

VEGABAR 74 - hygienic fitting 1

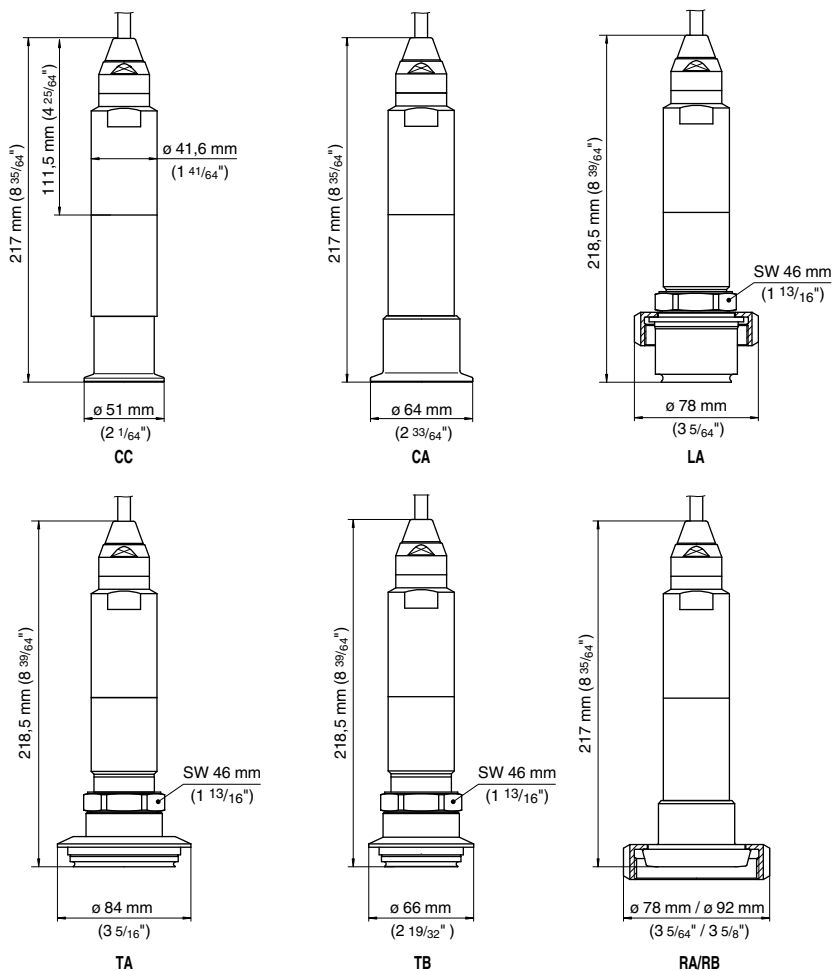


Fig. 13: VEGABAR 74 hygienic fitting: CC = Tri-Clamp 1½", CA = Tri-Clamp 2", LA = hygienic fitting with compression nut F40, TA = Tuchenhagen Varivent DN 32, TB = Tuchenhagen Varivent DN 25, RA/RB = bolting DN 40/DN 50 according to DIN 11851

VEGABAR 74 - hygienic fitting 2

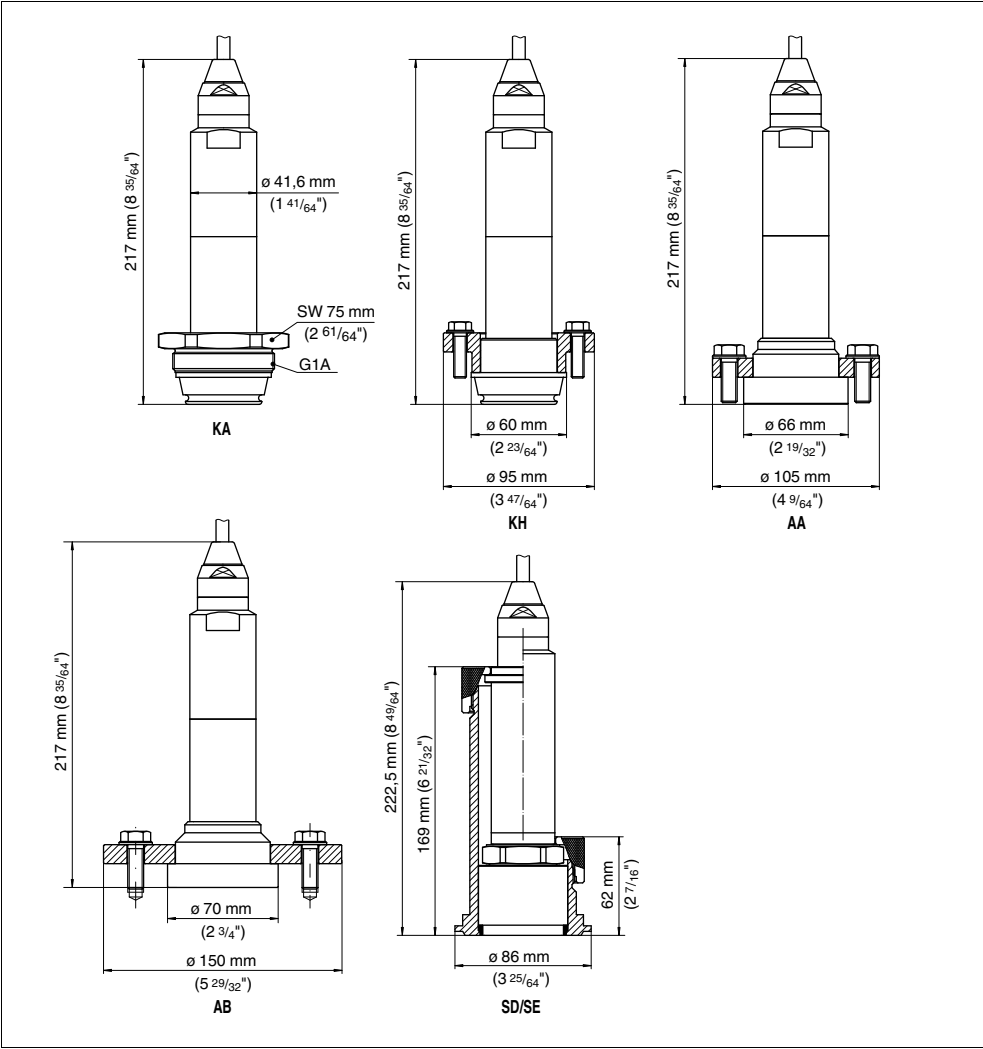


Fig. 14: VEGABAR 74 KA/KH = cone DN 40, AA = DRD, SD/SE = Anderson 3" long/short fitting

VEGABAR 74 - flange connection

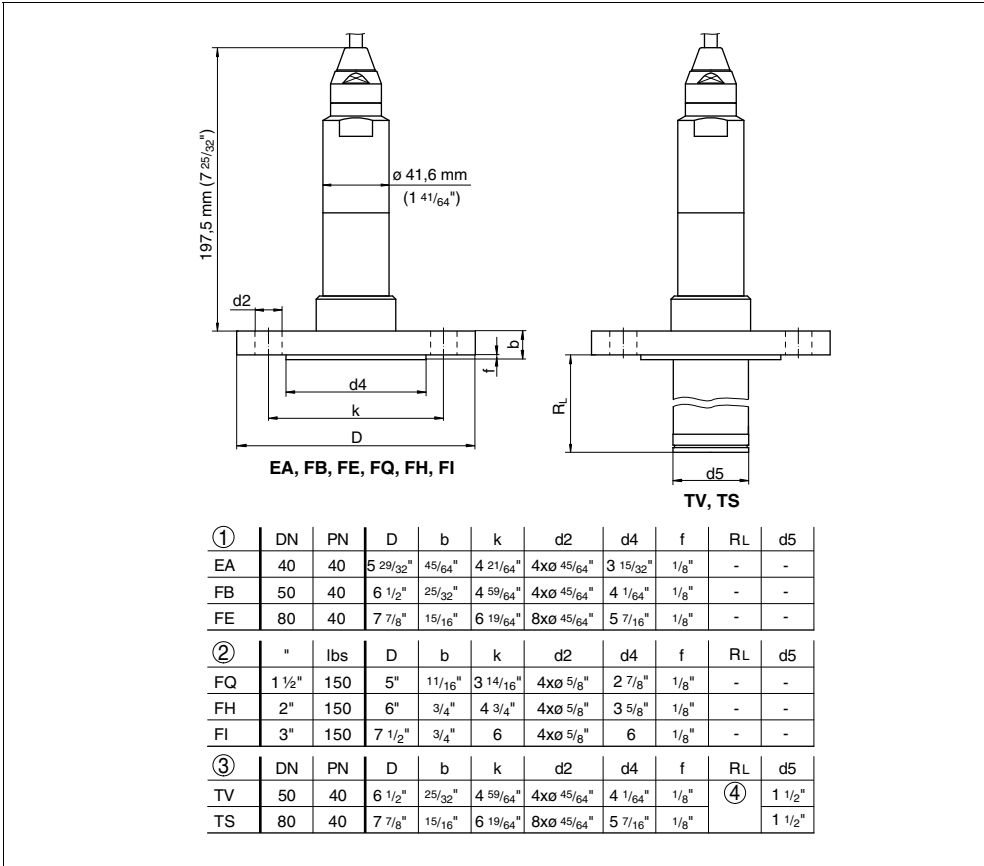


Fig. 15: VEGABAR 74 - flange connection
 1 Flange connection according to DIN 2501
 2 Flange fitting according to ANSI B16.5
 3 Flange with extension
 4 Order-specific

VEGABAR 74 - threaded fitting for paper industry

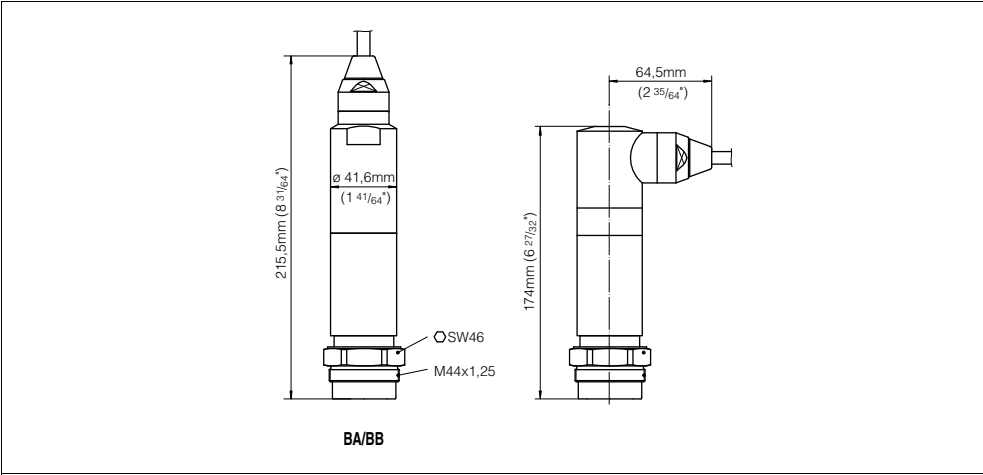


Fig. 16: VEGABAR 74 - connection for paper industry: BA/BB = M44x1.25

VEGABAR 74 - extension fitting for paper industry

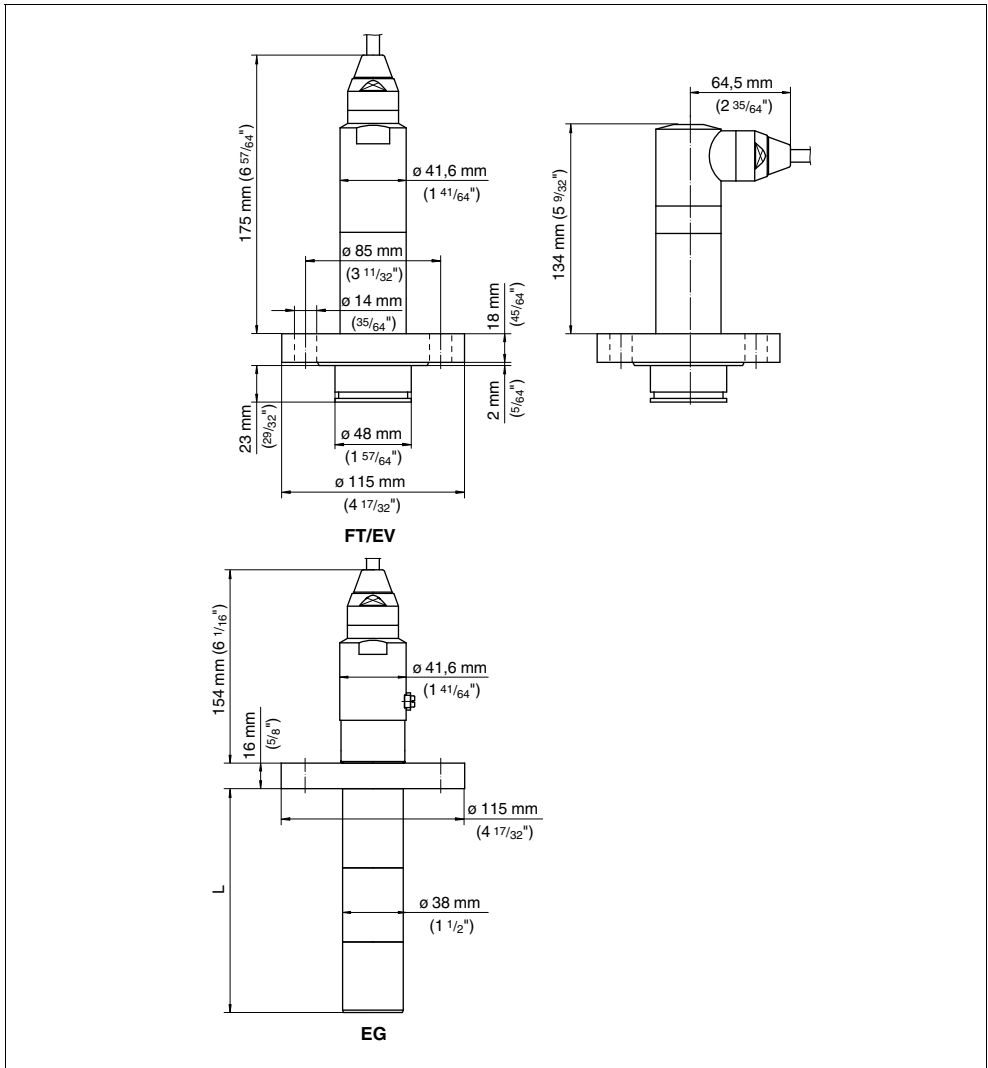


Fig. 17: VEGABAR 74 - extension fitting for paper industry: EV/FT = absolutely flush for pulper (EV 2-times flattened), EG = extension for ball valve fitting (L = order-specific)

10.3 Industrial property rights

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